Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.comdoi: 10.21276/jamdsr UGC approved journal no. 63854

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Article

Evaluation of different risk factors of Diabetic Retinopathy- A clinical study

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ABSTRACT:

Background: The major risk factors such as hyperglycemia and hypertension are extensively studied. The present study was conducted to assess risk factors of diabetic retinopathy. **Materials & Methods:** The present study was conducted on 210 patients of both genders. In all patients, blood pressure assessment, glycosylated hemoglobin (HbA1c), total cholesterol (TC), triglycerides (TG), high density lipoprotein cholesterol (HDL-C) and low density lipoprotein cholesterol (LDL-C) was done. **Results:** Out of 210 patients, males were 130 and females were 80. HbA1Ac >7 was seen in 69% and Diabetes duration >5 years in 52.7% and >10 years in 47.7%.Risk factors for DR was hypertension seen in 115, dyslipidemia in 162, diabetic nephropathy in 48 and hypertriglyceridemia in 65. The difference was significant (P< 0.05). **Conclusion:** Diabetic retinopathy has hypertension, dyslipidemia, diabetic nephropathy and hypertriglyceridemia as risk factors.

Key words: Diabetic retinopathy, Hyperglycemia, Risk

Received: 05 December 2018 Revised: 20 December 2018 Accepted: 07 January 2019

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This article may be cited as: Dar MA, Wani EA. Evaluation of different risk factors of diabetic retinopathy- A clinical study. J Adv Med Dent Scie Res 2019;7(2):71-73.

INTRODUCTION:

Diabetic retinopathy (DR) is the leading cause of blindness among working aged adults around the world. Despite the significance of this problem, and the rising prevalence of diabetes notably in emerging Asian countries such as India and China, there are few precise contemporary estimates of the worldwide prevalence of DR, particularly severe vision-threatening stages of the disease, including proliferative DR (PDR) and diabetic macular edema (DME).[1]

The Early Treatment Diabetic Retinopathy Study (ETDRS) has made an evolutional classification of DR that divided it into an early stage named as non-proliferative retinopathy (NPDR) and a severe level named proliferative retinopathy (PDR). The basic mechanisms by which diabetes mellitus (DM) generates microvascular complications are not fully elucidated. In fact, DR is a multifactorial diseaseand some studies reports the role of proinflammatory cytokines and angiogenesis stimulatory moleculesin the pathogenesis of the disease, in addition to chronicinflammation and oxidative stress caused by leukocytes.[2]

The major risk factors—hyperglycemia and hypertension—are extensively studied and show a strong association with DR. In consistency with UKPDS, controlled levels of blood pressure(BP) in hypertensive patients reduced 37% microvascular complications, 34% progression of the DR and 47% visualimpairment. In addition, people with a systolic blood pressure(SBP) higher than 140 mmHg presented three times more risk ofdeveloping DR.[3] The present study was conducted to assess risk factors of diabetic retinopathy.

MATERIALS & METHODS

The present study was conducted in department of Ophthalmology. It comprised of 210 patients of both genders. All were informed regarding the study and written consent was obtained. General information such as name, age, gender etc. was recorded. In all patients, blood pressure assessment, glycosylated hemoglobin (HbA1c), total cholesterol (TC), triglycerides (TG), high density lipoprotein cholesterol (HDL-C) and low density

lipoprotein cholesterol (LDL-C) was done. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I shows that out of 210 patients, males were 130 and females were 80. Table II, graph I shows that HbA1Ac >7 was seen in 69% and Diabetes duration >5 years in 52.7% and >10 years in 47.7%.Table III, graph II shows that risk factors for DR was hypertension seen in 115, dyslipidemia in 162, diabetic nephropathy in 48 and hypertriglyceridemia in 65. The difference was significant (P< 0.05).

Table I: Distribution of subjects

Total- 210		
Gender	**Males**	**Females**
Number	130	80

Table II: Demographic profile in patients

Parameters	**Number**	**Percentage**
HbA1Ac >7	145	69
Diabetes duration >5 years	110	52.3
>10years	100	47.7

Graph I:Demographic profile

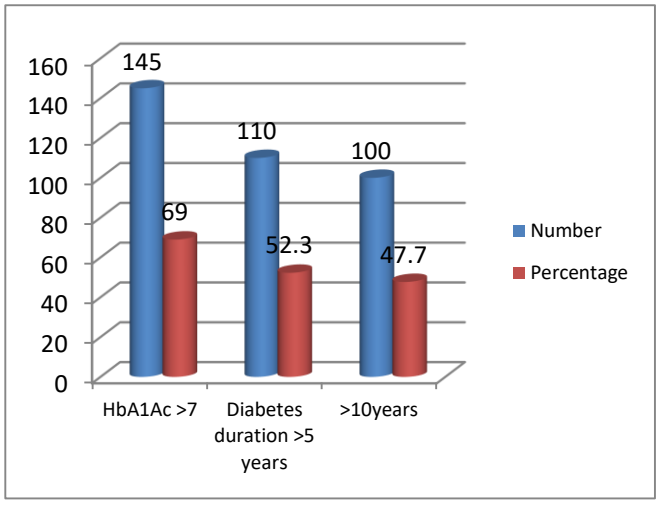

Table III: Risk factors of DR

Risk factors	**Number**	**P value**
Hypertension	115	0.05
Dyslipidemia	162	
Diabetic nephropathy	48	
Hypertriglyceridemia	65	

DISCUSSION

Diabetes mellitus (DM) is a metabolic syndrome with an increasing prevalence and high mortality rate. Diabetic retinopathy (DR) is a common ocular complication of DM and is considered to be one of the leading causes of vision loss and vision impairment in adults. With the progression of DR, the quality of life of patients decreases, and the financial burden on society increases, both in the DR screening and treatment groups.[4]

Blindness due to DR has a significant impact on patients' quality of life, and can compromise their ability to manage their disease successfully, which can in turn have a negative impact on the incidence of other diabetic complications and overall life expectancy. DR is also a key indicator of other systemic microvascular complications like diabetic neuropathy and diabetic nephropathy. Thus, it is crucial to study the risk factors for the development of diabetic retinopathy so that necessary control measures can be taken in DM patients with these risk factors to prevent the development of DR at early stages.[5]The present study was conducted to assess risk factors of diabetic retinopathy.

We found that out of 210 patients, males were 130 and females were 80. Wong et al[6] found 35 studies (1980–2008) provided data from 22,896 individuals with diabetes. The overall prevalence was 34.6% (95% CI 34.5–34.8) for any DR, 6.96% (6.87–7.04) for proliferative DR, 6.81% (6.74–6.89) for diabetic macular edema, and 10.2% (10.1–10.3) for VTDR. All DR prevalence end points increased with diabetes duration, hemoglobin A1c, and blood pressure levels and were higher in people with type 1 compared with type 2 diabetes.

We found that HbA1Ac >7 was seen in 69% and Diabetes duration >5 years in 52.7% and >10 years in 47.7%. Haffner et al[7] in their study found that the prevalence of diabetic retinopathy was 21% (5% proliferative and 95% non-proliferative). There was a statistically significant association between diabetic retinopathy and age, total cholesterol dyslipidemia, metabolic control prevalence ratio, pharmacological treatment prevalence ratio and use of insulin prevalence ratio on the other hand, there is no statistically significant association with sex, duration of disease, unaware of being diabetic, high blood pressure, glycosylated hemoglobin, triglycerides, HDL-C and LDL-C. The age, presence of dyslipidemia, metabolic control and diabetic treatment are risk factors that promote the development of diabetic retinopathy; so they must be taken into account from the first medical appointment for early detection, timely treatment and if necessary refer to the specialist.

In present study we found that risk factors for DR was hypertension seen in 115, dyslipidemia in 162, diabetic nephropathy in 48 and hypertriglyceridemia in 65. Hamman et al[8] in their study observed that mean age of group case was 59.5 years with a slight female predominance. Gender, age, body mass index were not associated with outcome. Individuals with poor glycemic

control were more likely to DR. It was observed a positive relationship between duration of DM and DR, with higher chances in 11–15 years of disease and >15 years. Regarding comorbidities, only diabetic nephropathy showed higher chance for DR.

Harris et al[9] found that Younger age, longer diabetes duration, higher SBP, higher FBG and higher HbA1c were found to be independent risk factors for both DR and STDR in the eight-factor analyses. In the all-factor analysis, younger age, longer diabetes duration, higher SBP, oral medicine use and insulin use were independent risk factors for both DR and STDR; higher postprandial blood glucose (PBG), HbA1c, triglyceride and low-density lipoprotein were independent risk factors for DR only, and higher FBG was a risk factor for STDR only.

CONCLUSION

Diabetic retinopathy has hypertension, dyslipidemia, diabetic nephropathy and hypertriglyceridemia as risk factors.

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